

Amendments to the Claims

The listing of claims below will replace all prior versions and listings of claims in the present application.

Claim Listing

1 1. (Original) A method for servicing transit and transmit traffic in a node of a
2 network, the network including a plurality of nodes connected by first and second rings
3 formed by two or more transmission media, the method comprising:
4 receiving usage data from a downstream node;
5 identifying a first weighted value associated with a provisioning rate associated with
6 the downstream node and a second weighted value associated with a
7 provisioning rate of the node;
8 determining an allowed usage for the node using the usage data and the first and
9 second weighted values; and
10 servicing transmit and transit traffic received at the node including limiting the
11 servicing of the transmit traffic in accordance with the determined allowed
12 usage.

1 2. (Currently Amended) The method of claim 1, further comprising
2 determining usage data for the node based on the usage data received from the
3 downstream node; and
4 forwarding the usage data for the node to an upstream node.

1 3. (Currently Amended) The method of claim 2, wherein the step of determining
2 usage data includes
3 determining if the node is congested;
4 ~~determine~~ determining if the usage data received indicates that a downstream node is
5 congested;
6 if both the node and the downstream node are congested, calculating the usage data to
7 be the minimum of the prior actual usage data and the product of the ratio of

the maximum provisioned usage rate factors for the node and the downstream node and the usage data received;
if the node is congested and the downstream node is not congested, maintaining the usage data for the node in an unchanged state; and
if the node is not congested,
determining if an actual weighted forward rate for the node is less than the received usage data,
if the actual weighted forward rate is less than the received usage data, setting the usage data for the node to indicate to an upstream node that the node is not congested, and
if the actual weighted forward rate is greater than or equal to the received usage data, setting the usage data for the node to be the received usage data.

4. (Original) The method of claim 1, wherein the step of determining the allowed usage for the node includes
determining if the node is congested;
determining if the usage data received indicates that a downstream node is congested;
if both the node and the downstream node are congested, calculating the allowed usage to be the product of the ratio of the maximum provisioned usage rate factors for the node and the downstream node and the usage data received;
if the node is congested and the downstream node is not congested, maintaining the allowed usage for the node in an unchanged state; and
if the node is not congested, setting the allowed usage to be the usage value received from the downstream node.

5. (Original) The method of claim 1, further comprising receiving the first weighted value along with the usage data from the downstream node.

6. (Original) The method of claim 5, further comprising receiving the first weighted value and the usage data as a scalar that describes a ratio between the two.

1 7. (Original) The method of claim 1, wherein the step of identifying the first and
2 second weighted values includes retrieving the first and second weighted values from a table
3 accessible by the node.

1 8. (Original) A method for servicing transit and transmit traffic in a node of a
2 network, the network including a plurality of nodes connected by first and second rings
3 formed by two or more transmission media, the method comprising:
4 receiving usage data and a desired forwarding rate from a downstream node;
5 identifying a first weighted value associated with a provisioning rate associated with
6 the downstream node and a second weighted value associated with a
7 provisioning rate of the node;
8 determining an allowed usage for the node using the usage data and the first and
9 second weighted values;
10 determining an allowed forwarding rate for the node defining a rate at which the
11 transit and transmit traffic combined is forwarded onto a ring using the
12 received desired forwarding rate;
13 servicing transmit and transit traffic received at the node including limiting the
14 servicing of the transmit traffic in accordance with the determined allowed
15 usage and all traffic in accordance with the determined allowed forwarding
16 rate.

1 9. (Original) The method of claim 8, further comprising
2 determining a desired forward rate for an upstream node based on the congestion state
3 of the node and the usage data received from the downstream node; and
4 forwarding the desired forward rate to the upstream node.

1 10. (Original) The method of claim 9, wherein the step of determining the desired
2 forward rate for a node includes
3 determining if the node is congested;
4 determining if the usage data received indicates that a downstream node is congested;

5 if both the node and the downstream node are congested, determining if a transmit
 6 queue is empty;
 7 if the transmit queue is not empty, determining if the allowed rate for the node is
 8 greater than the actual usage plus a predetermined amount;
 9 if the allowed rate is greater, calculating the desired forward rate to be a minimum of
 10 a suggested rate term and the upstream line rate where the suggested rate term
 11 is the sum of the desired forward rate received and a drop rate for the node
 12 minus a usage term where the usage term is a predetermined value;
 13 if the transmit queue is empty or if the allowed rate is less, calculating the desired
 14 forward rate to be a minimum of two terms, where a first term is the sum of
 15 the desired forward rate received and the drop rate for the node minus the
 16 actual usage rate for the node and where the second term is the sum of the
 17 minimum span line rate and the drop rate for the node minus the actual usage
 18 rate for the node;
 19 if the node is congested and the downstream node is not congested, calculating the
 20 desired forward rate to be the sum of two terms, where the first term is the
 21 difference of the downstream line rate and the actual usage and the second
 22 term is the difference of the drop rate for the node and a predetermined
 23 amount; and
 24 if the node is not congested, setting the desired forward rate to be equal to the
 25 upstream line rate.

1 11. (Original) The method of claim 10 where the predetermined value is a constant.

1 12. (Original) The method of claim 10 where the predetermined value is the
 2 difference of the allowed usage and the actual usage rate divided by two.

1 13. (Currently Amended) The method of claim 8, further comprising
 2 determining usage data for the node based on the usage data received from the
 3 downstream node; and
 4 forwarding the usage data for the node to an upstream node.

1 14. (Original) The method of claim 13, wherein the step of determining usage data
2 includes determining if the node is congested;
3 determine if the usage data received indicates that a downstream node is congested;
4 if both the node and the downstream node are congested, calculating the usage data to
5 be the minimum of the prior actual usage data and the product of the ratio of
6 the maximum provisioned usage rate factors for the node and the downstream
7 node and the usage data received;
8 if the node is congested and the downstream node is not congested, maintaining the
9 usage data for the node in an unchanged state; and
10 if the node is not congested,
11 determining if an actual weighted forward rate for the node is less than the received
12 usage data,
13 if the actual weighted forward rate is less than the received usage data, setting the
14 usage data for the node to indicate to an upstream node that the node is not
15 congested, and
16 if the actual weighted forward rate is greater than or equal to the received usage data,
17 setting the usage data for the node to be the received usage data.

1 15. (Original) The method of claim 8, wherein the step of determining the allowed
2 forward rate for a node includes
3 determining if the node is congested;
4 determining if the usage data received indicates that a downstream node is congested;
5 if both the node and the downstream node are congested, determining if a transmit
6 queue is empty;
7 if the transmit queue is not empty, determining if the allowed rate for the node is
8 greater than the actual usage plus a predetermined amount;
9 if the allowed rate is greater, setting the nodes allowed forward rate to be the
10 minimum of a suggested rate term and the downstream line rate where the
11 suggested rate term is the sum of the desired forward rate received and the
12 allowed usage minus the actual usage for the node;

13 if the transmit queue is empty or if the allowed rate is less, setting the allowed
14 forward rate for the node to be the maximum of the desired forward rate
15 received and the minimum span line rate;
16 if the node is congested and the downstream node is not, configuring the node to send
17 at the full downstream rate including setting the allowed forward rate to be
18 equal to the downstream line rate; and
19 if the node is not congested, setting the allowed line rate to the desired forward rate
20 received.

1 16. (Original) The method of claim 8, wherein the step of determining the allowed
2 usage for the node includes
3 determining if the node is congested;
4 determining if the usage data received indicates that a downstream node is congested;
5 if both the node and the downstream node are congested, calculating the allowed
6 usage to be the product of the ratio of the maximum provisioned usage rate
7 factors for the node and the downstream node and the usage data received;
8 if the node is congested and the downstream node is not congested, maintaining the
9 allowed usage for the node in an unchanged state; and
10 if the node is not congested, setting the allowed usage to be the usage value received
11 from the downstream node.

1 17. (Original) The method of claim 8, further comprising receiving the first
2 weighted value along with the usage data from the downstream node.

1 18. (Original) The method of claim 17, further comprising receiving the first
2 weighted value and the usage data as a scalar that describes a ratio between the two.

1 19. (Original) The method of claim 8, wherein the step of identifying the first and
2 second weighted values includes retrieving the first and second weighted values from a table
3 accessible by the node.

1 20. (Original) A node in a network including a plurality of nodes connected by first
2 and second rings formed by two or more transmission media, the node comprising:
3 fairness logic configured to
4 receive usage data from a downstream node;
5 identify a first weighted value associated with a provisioning rate associated with the
6 downstream node and a second weighted value associated with a provisioning
7 rate of the node;
8 determine an allowed usage for the node using the usage data and the first and second
9 weighted values; and
10 service transmit and transit traffic received at the node including limiting the
11 servicing of the transmit traffic in accordance with the determined allowed
12 usage.

1 21. (Original) A node in a network including a plurality of nodes connected by first
2 and second rings formed by two or more transmission media, the node comprising:
3 fairness logic configured to
4 receive a desired forwarding rate from a downstream node;
5 determine an allowed forwarding rate for the node defining a rate at which the transit
6 and transmit traffic combined is forwarded onto a ring using the received
7 desired forwarding rate; and
8 service transmit and transit traffic received at the node including limiting all traffic in
9 accordance with the determined allowed forwarding rate.

1 22-28. (Cancelled)